

Munich Cancer Registry



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- ▶ Selection Matrix
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ICD-10 C19, C20: Rectal cancer

Survival

| | | |
|-------------------|------------|-----------|
| Year of diagnosis | 1988-1997 | 1998-2020 |
| Patients | 3,825 | 21,361 |
| Diseases | 3,827 | 21,390 |
| Cases evaluated | 3,442 | 17,122 |
| Creation date | 04/15/2022 | |
| Database export | 12/20/2021 | |
| Population | 4.92 m | |



Munich Cancer Registry
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Munich, 81377
Germany

<https://www.tumorregister-muenchen.de/en>

<https://www.tumorregister-muenchen.de/en/facts/surv/sC1920E-ICD-10-C19-C20-Rectal-cancer-survival.pdf>

Index of figures and tables

| Fig./Tbl. | Page |
|--|------|
| 1a Relative survival by period of diagnosis (chart) | 3 |
| 1b Survival by period of diagnosis (table) | 3 |
| 2a Survival by sex (chart) | 4 |
| 2b Survival by sex (table) | 4 |
| 3a Observed survival by age category (chart) | 5 |
| 3b Relative survival by age category (chart) | 5 |
| 3c Survival by age category (table) | 6 |
| 4a Relative survival by UICC (chart) | 7 |
| 4b Survival by UICC (table) | 7 |
| 4c Conditional survival by UICC (chart) | 8 |
| 4d Conditional survival by UICC (table) | 8 |
| 4g Relative survival by TNM staging (chart) | 9 |
| 4h Survival by TNM staging (table) | 9 |
| 5a Time to first progression (chart) | 11 |
| 5b Time to first progression (table) | 11 |
| 5c Observed post-progression survival (chart) | 13 |
| 5d Observed post-progression survival (table) | 13 |
| 5e Observed post-progression survival by period of progression (chart) | 14 |
| 5f Observed post-progression survival by period of progression (table) | 14 |

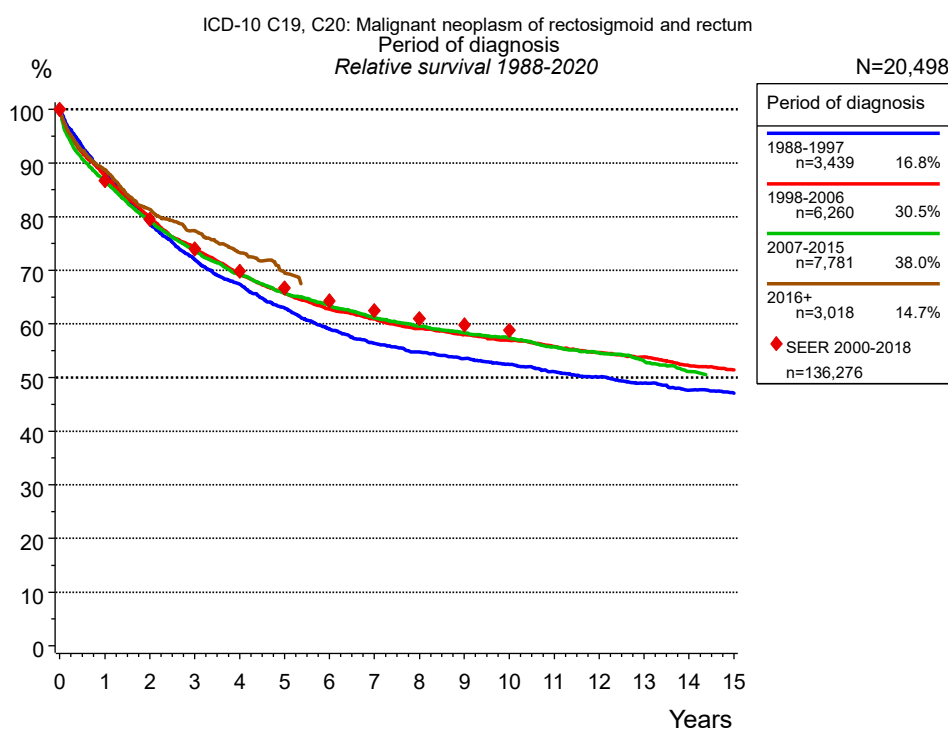


Figure 1a. Relative survival of patients with rectal cancer by period of diagnosis. Included in the evaluation are 20,498 cases diagnosed between 1988 and 2020.

The survival results of the SEER program (Surveillance, Epidemiology, and End Results) of the American National Cancer Institute (NCI) are summarized as the period of diagnosis from 2000 to 2018, and are represented by colored diamonds in order to facilitate comparisons between MCR and SEER.

The presented survival curves are derived from clinical records with valid follow-up informations, which means that death certificate cases (DCO) cases are omitted from the analysis. With this one restriction, the MCR has provided population-based statistics since 1998, collecting data on all cancer cases in the region of southern Bavaria. Historical data of previous time periods can be heavily selected, therefore, univariate survival comparisons of the presented time periods must be carefully considered. Nonetheless, all calculable survival curves are depicted to facilitate the comparison of long time follow-up analyses of relative survival between particular cancers.

| Years | Period of diagnosis | | | | | | | |
|--------|----------------------|--------|----------------------|--------|----------------------|--------|------------------|--------|
| | 1988-1997 n=3,439 | | 1998-2006 n=6,260 | | 2007-2015 n=7,781 | | 2016+ n=3,018 | |
| | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 85.2 | 88.0 | 84.9 | 87.7 | 84.0 | 86.6 | 86.3 | 88.7 |
| 2 | 73.9 | 78.7 | 75.0 | 79.7 | 74.9 | 79.3 | 77.2 | 81.4 |
| 3 | 65.7 | 72.1 | 67.9 | 74.2 | 67.7 | 73.7 | 71.5 | 77.4 |
| 4 | 59.6 | 67.4 | 61.7 | 69.3 | 61.8 | 69.1 | 66.1 | 73.3 |
| 5 | 54.0 | 63.0 | 56.9 | 65.8 | 57.2 | 65.7 | 60.7 | 69.4 |
| 6 | 49.0 | 59.0 | 52.8 | 62.8 | 53.6 | 63.4 | | |
| 7 | 45.4 | 56.4 | 49.9 | 61.0 | 50.2 | 61.1 | | |
| 8 | 42.8 | 54.8 | 47.0 | 59.1 | 47.6 | 59.6 | | |
| 9 | 40.5 | 53.6 | 44.7 | 58.0 | 45.2 | 58.3 | | |
| 10 | 38.4 | 52.4 | 42.5 | 56.9 | 43.1 | 57.5 | | |
| 11 | 36.3 | 51.1 | 40.4 | 55.8 | 40.4 | 55.7 | | |
| 12 | 34.4 | 50.1 | 38.3 | 54.7 | 38.3 | 54.6 | | |
| 13 | 32.6 | 49.0 | 36.5 | 53.9 | 35.8 | 53.1 | | |
| 14 | 30.7 | 47.7 | 34.2 | 52.2 | 33.2 | 51.1 | | |
| 15 | 29.3 | 47.1 | 32.4 | 51.4 | | | | |
| Median | 5.8 | | 6.9 | | 7.1 | | | |

Table 1b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by period of diagnosis for period 1988-2020 (N=20,498).

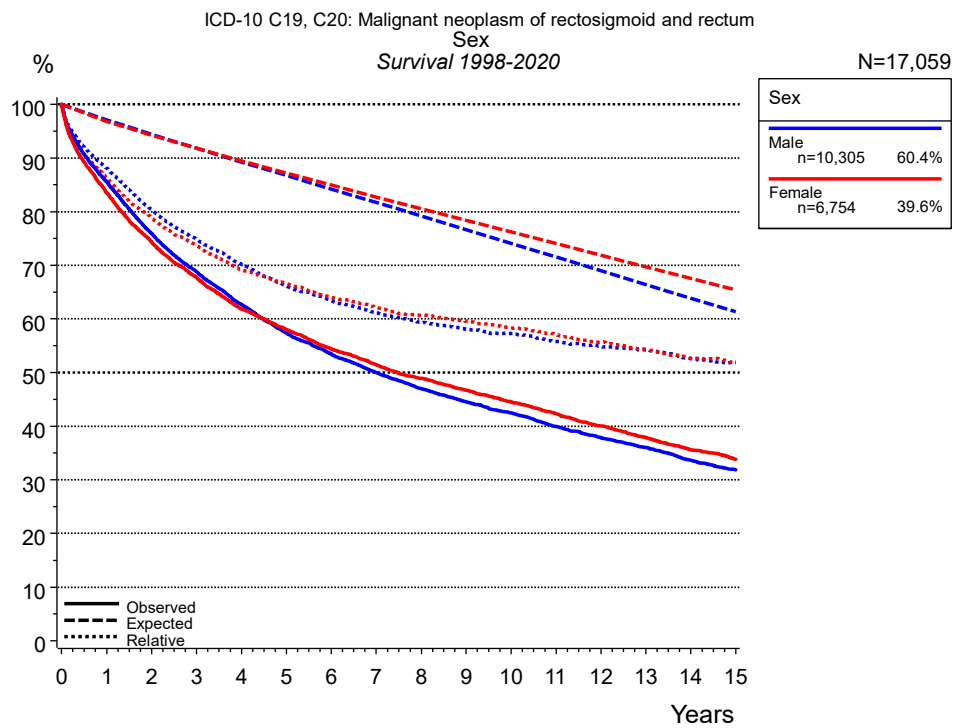


Figure 2a. Survival of patients with rectal cancer by sex. Included in the evaluation are 17,059 cases diagnosed between 1998 and 2020.

| Years | Sex | | | |
|--------|------------------|--------|-------------------|--------|
| | Male n=10,305 | | Female n=6,754 | |
| | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 85.6 | 88.1 | 83.5 | 86.3 |
| 2 | 75.9 | 80.4 | 74.3 | 78.9 |
| 3 | 68.8 | 74.9 | 67.7 | 73.7 |
| 4 | 62.7 | 70.2 | 61.8 | 69.1 |
| 5 | 57.4 | 66.1 | 58.0 | 66.5 |
| 6 | 53.4 | 63.5 | 54.4 | 64.0 |
| 7 | 50.0 | 61.2 | 51.4 | 62.1 |
| 8 | 47.0 | 59.4 | 48.9 | 60.7 |
| 9 | 44.5 | 58.1 | 46.7 | 59.6 |
| 10 | 42.4 | 57.3 | 44.5 | 58.3 |
| 11 | 39.9 | 55.8 | 42.3 | 57.1 |
| 12 | 37.9 | 54.9 | 40.0 | 55.7 |
| 13 | 36.1 | 54.3 | 37.9 | 54.3 |
| 14 | 33.6 | 52.6 | 35.5 | 52.6 |
| 15 | 31.8 | 51.9 | 33.8 | 51.7 |
| Median | 7.0 | | 7.5 | |

Table 2b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by sex for period 1998-2020 (N=17,059).

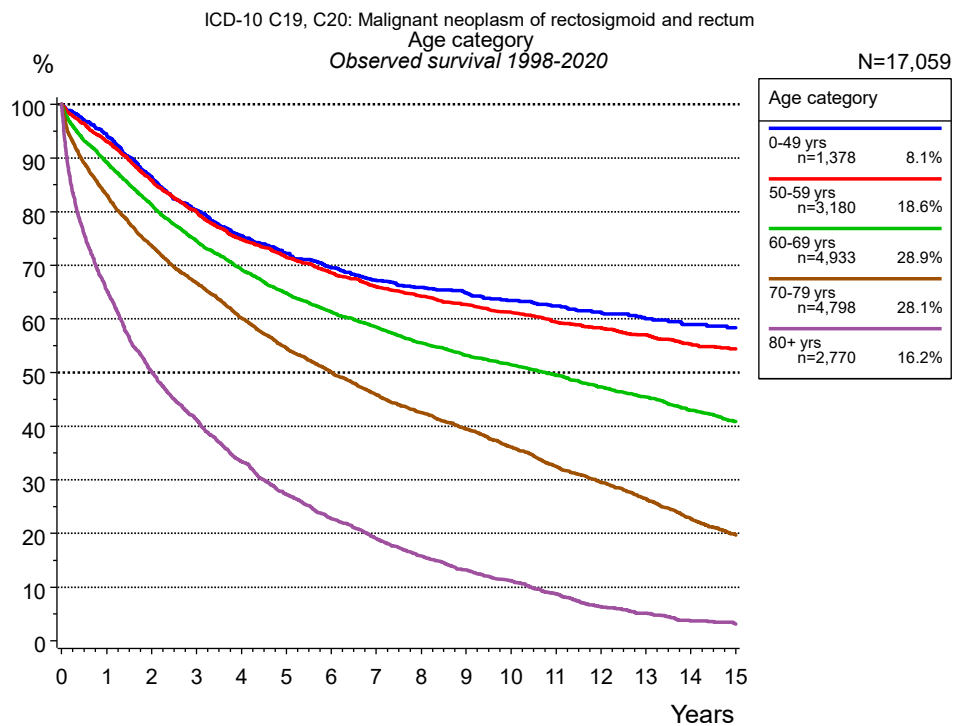


Figure 3a. Observed survival of patients with rectal cancer by age category. Included in the evaluation are 17,059 cases diagnosed between 1998 and 2020.

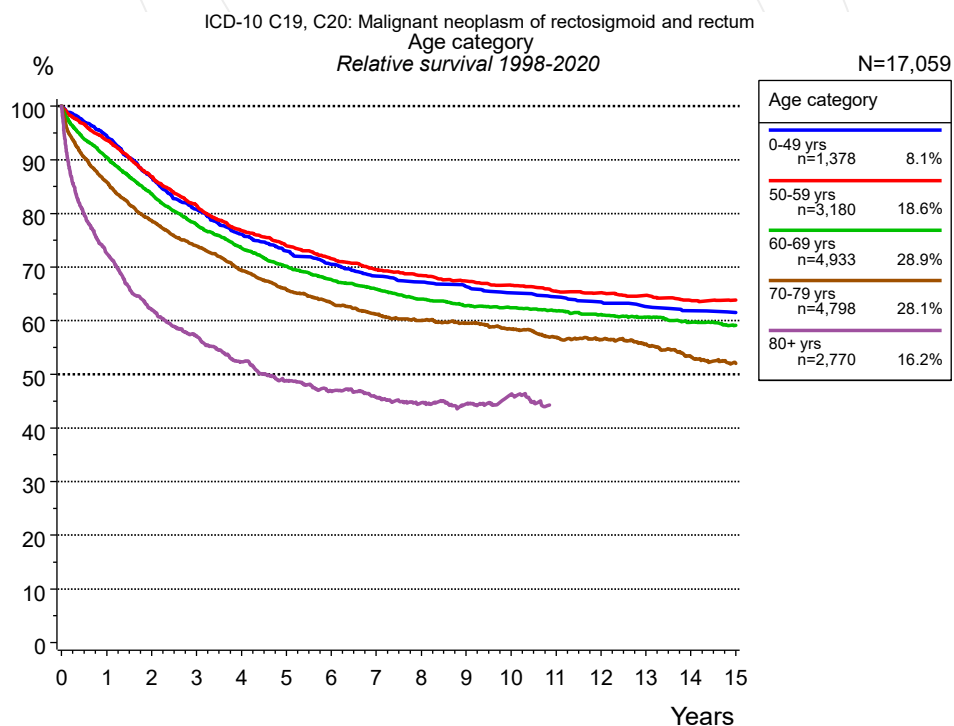


Figure 3b. Relative survival of patients with rectal cancer by age category. Included in the evaluation are 17,059 cases diagnosed between 1998 and 2020.

| Years | Age category | | | | | | | | | |
|--------|---------------------|--------|----------------------|--------|----------------------|--------|----------------------|--------|--------------------|--------|
| | 0-49 yrs n=1,378 | | 50-59 yrs n=3,180 | | 60-69 yrs n=4,933 | | 70-79 yrs n=4,798 | | 80+ yrs n=2,770 | |
| | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 94.3 | 94.4 | 93.1 | 93.6 | 89.3 | 90.5 | 83.2 | 85.8 | 65.4 | 72.6 |
| 2 | 86.4 | 86.7 | 85.8 | 86.8 | 81.3 | 83.6 | 73.7 | 78.7 | 50.2 | 62.1 |
| 3 | 80.3 | 80.7 | 80.0 | 81.5 | 74.5 | 77.9 | 66.7 | 73.9 | 41.2 | 57.1 |
| 4 | 75.5 | 76.1 | 74.8 | 76.8 | 69.2 | 73.6 | 60.2 | 69.5 | 33.4 | 52.3 |
| 5 | 72.2 | 73.0 | 71.5 | 74.0 | 64.8 | 70.2 | 54.5 | 65.8 | 27.3 | 48.8 |
| 6 | 69.6 | 70.5 | 68.6 | 71.6 | 61.3 | 67.6 | 50.1 | 63.3 | 22.8 | 46.9 |
| 7 | 67.1 | 68.3 | 66.0 | 69.5 | 58.5 | 65.9 | 45.9 | 61.2 | 19.1 | 45.7 |
| 8 | 65.9 | 67.2 | 64.2 | 68.4 | 55.5 | 64.0 | 42.5 | 60.1 | 15.8 | 44.7 |
| 9 | 64.9 | 66.4 | 62.6 | 67.4 | 53.1 | 62.8 | 39.5 | 59.5 | 13.2 | 44.5 |
| 10 | 63.4 | 65.2 | 61.2 | 66.6 | 51.4 | 62.4 | 36.1 | 58.4 | 11.3 | 46.3 |
| 11 | 62.4 | 64.4 | 59.4 | 65.5 | 49.5 | 61.9 | 32.5 | 56.9 | 8.8 | 44.8 |
| 12 | 61.3 | 63.5 | 58.3 | 65.2 | 47.3 | 61.1 | 29.6 | 56.4 | 6.4 | 41.0 |
| 13 | 60.0 | 62.6 | 57.0 | 64.7 | 45.4 | 60.7 | 26.5 | 55.7 | 5.2 | 42.9 |
| 14 | 59.0 | 61.9 | 55.2 | 63.8 | 42.9 | 59.6 | 22.8 | 53.3 | 3.7 | 41.7 |
| 15 | 58.3 | 61.5 | 54.4 | 63.9 | 40.9 | 59.1 | 19.7 | 52.1 | 3.1 | 47.7 |
| Median | | | 18.4 | | 10.8 | | 6.0 | | 2.0 | |

Table 3c. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by age category for period 1998-2020 (N=17,059).

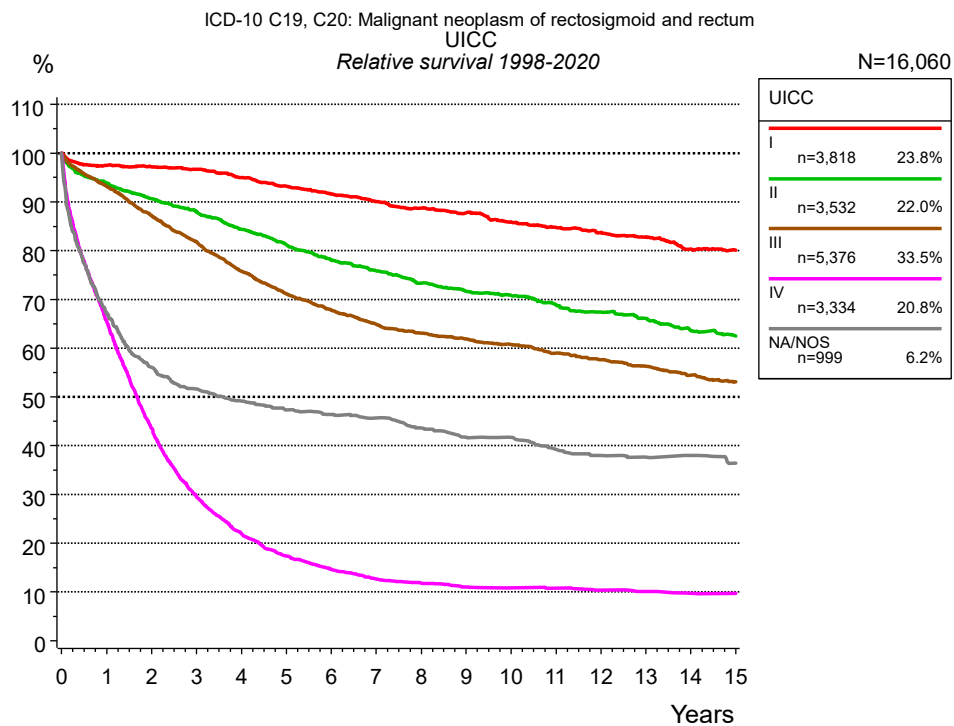


Figure 4a. Relative survival of patients with rectal cancer by UICC. For 16,170 of 17,059 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 16,060 cases an evaluable classification was established. The grey line represents the subgroup of 999 patients with missing values regarding UICC (5.9 % of 17,059 patients, the percent values of all other categories are related to n=16,060).

| Years | UICC | | | | | | | | | |
|--------|--------------|--------|---------------|--------|----------------|--------|---------------|--------|-----------------|--------|
| | I n=3,818 | | II n=3,532 | | III n=5,376 | | IV n=3,334 | | NA/NOS n=999 | |
| | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 94.7 | 97.5 | 90.8 | 93.9 | 90.8 | 93.2 | 63.8 | 65.5 | 63.4 | 67.2 |
| 2 | 91.7 | 97.2 | 84.9 | 90.6 | 82.8 | 87.2 | 41.5 | 43.6 | 50.7 | 56.0 |
| 3 | 88.5 | 96.7 | 79.9 | 87.9 | 75.9 | 81.8 | 27.6 | 29.5 | 45.4 | 51.7 |
| 4 | 84.3 | 95.0 | 74.4 | 84.4 | 68.6 | 75.8 | 20.2 | 22.0 | 41.8 | 49.2 |
| 5 | 80.3 | 93.2 | 69.4 | 81.2 | 62.8 | 71.2 | 15.6 | 17.4 | 39.2 | 47.3 |
| 6 | 76.5 | 91.6 | 64.6 | 78.0 | 58.4 | 67.8 | 12.9 | 14.7 | 37.6 | 46.4 |
| 7 | 72.9 | 90.1 | 60.8 | 75.8 | 54.5 | 64.9 | 10.9 | 12.6 | 36.1 | 45.7 |
| 8 | 69.6 | 88.8 | 57.0 | 73.3 | 51.7 | 63.1 | 10.0 | 11.8 | 33.7 | 43.6 |
| 9 | 66.5 | 87.7 | 53.9 | 71.7 | 49.4 | 61.9 | 9.1 | 11.0 | 31.5 | 41.8 |
| 10 | 62.9 | 85.9 | 51.5 | 70.8 | 47.1 | 60.8 | 8.7 | 10.8 | 30.6 | 41.7 |
| 11 | 59.9 | 84.7 | 48.4 | 68.8 | 44.4 | 59.0 | 8.4 | 10.7 | 28.0 | 39.3 |
| 12 | 57.1 | 83.7 | 45.7 | 67.4 | 42.1 | 57.6 | 7.9 | 10.4 | 26.4 | 38.0 |
| 13 | 54.4 | 82.8 | 43.1 | 66.1 | 39.9 | 56.3 | 7.5 | 10.1 | 25.5 | 37.7 |
| 14 | 50.7 | 80.3 | 40.0 | 63.6 | 37.3 | 54.5 | 7.1 | 9.7 | 25.1 | 38.0 |
| 15 | 48.6 | 80.1 | 37.7 | 62.5 | 35.2 | 53.1 | 6.9 | 9.7 | 23.3 | 36.4 |
| Median | 14.4 | | 10.5 | | 8.7 | | 1.6 | | 2.1 | |

Table 4b. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by UICC for period 1998-2020 (N=16,060).

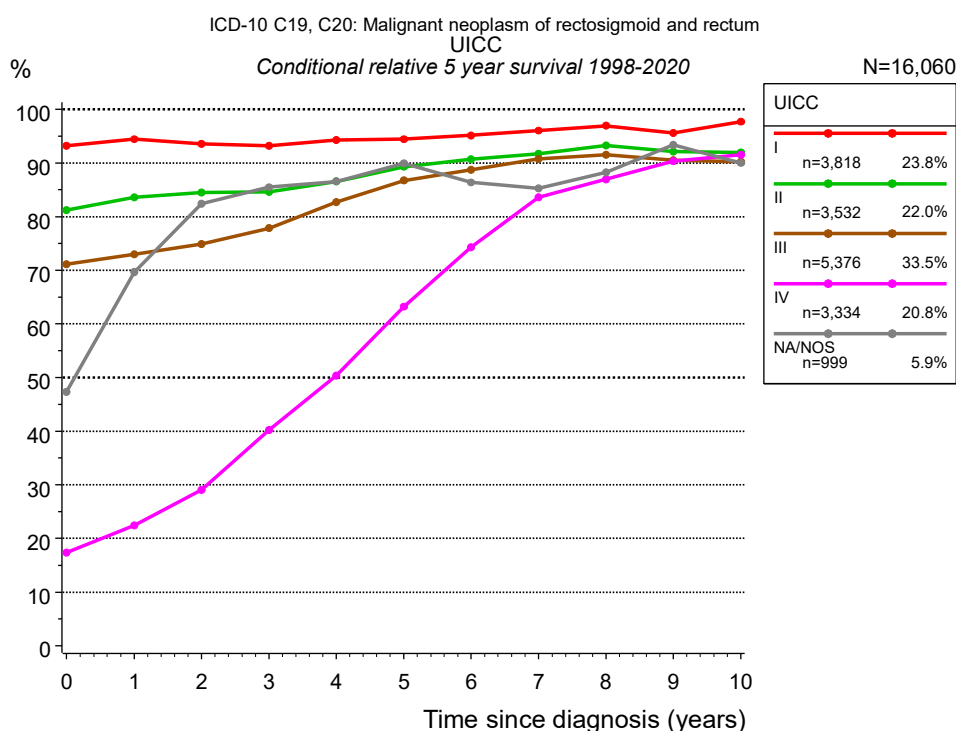


Figure 4c. Conditional relative 5-year survival of patients with rectal cancer by UICC. For 16,170 of 17,059 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 16,060 cases an evaluable classification was established. The grey line represents the subgroup of 999 patients with missing values regarding UICC (5.9 % of 17,059 patients, the percent values of all other categories are related to n=16,060).

| Years | UICC | | | | | | | | | |
|-------|-------|---------------------|-------|---------------------|-------|---------------------|-------|---------------------|--------|---------------------|
| | I | | II | | III | | IV | | NA/NOS | |
| | n | Cond. surv. % 5 yrs | n | Cond. surv. % 5 yrs | n | Cond. surv. % 5 yrs | n | Cond. surv. % 5 yrs | n | Cond. surv. % 5 yrs |
| 0 | 3,818 | 93.2 | 3,532 | 81.2 | 5,376 | 71.2 | 3,334 | 17.4 | 999 | 47.3 |
| 1 | 3,506 | 94.4 | 3,140 | 83.6 | 4,767 | 73.0 | 2,081 | 22.4 | 609 | 69.7 |
| 2 | 3,295 | 93.6 | 2,863 | 84.5 | 4,179 | 74.9 | 1,290 | 29.1 | 479 | 82.4 |
| 3 | 3,057 | 93.2 | 2,594 | 84.6 | 3,659 | 77.9 | 809 | 40.2 | 409 | 85.5 |
| 4 | 2,788 | 94.2 | 2,317 | 86.6 | 3,109 | 82.7 | 547 | 50.4 | 364 | 86.6 |
| 5 | 2,530 | 94.4 | 2,063 | 89.3 | 2,656 | 86.7 | 382 | 63.2 | 325 | 90.0 |
| 6 | 2,277 | 95.2 | 1,820 | 90.7 | 2,294 | 88.7 | 296 | 74.3 | 300 | 86.4 |
| 7 | 2,042 | 96.1 | 1,616 | 91.7 | 1,984 | 90.8 | 222 | 83.6 | 278 | 85.2 |
| 8 | 1,829 | 96.9 | 1,398 | 93.2 | 1,711 | 91.5 | 190 | 87.0 | 248 | 88.3 |
| 9 | 1,628 | 95.6 | 1,244 | 92.1 | 1,492 | 90.5 | 153 | 90.3 | 220 | 93.4 |
| 10 | 1,431 | 97.7 | 1,100 | 91.9 | 1,263 | 90.3 | 129 | 91.5 | 201 | 90.0 |

Table 4d. Conditional relative 5-year survival of patients with rectal cancer by UICC for period 1998-2020 (N=16,060).

Conditional relative survival rates refer to the relative survival probability, in this case for 5 years after cancer diagnosis, compared to the age- and sex-matched population (=100 %) under the condition of being alive for a certain time period (x-axis in Figure 4a). The results illustrate to what extent the cancer induced mortality of particular subgroups declines in the subsequent years after detection of the malignancy. For instance, according to the presented survival statistics, patients in the subgroup UICC="I", who are alive at least 3 years after cancer diagnosis, the conditional relative 5-year survival rate is 93.2% (n=3,057).

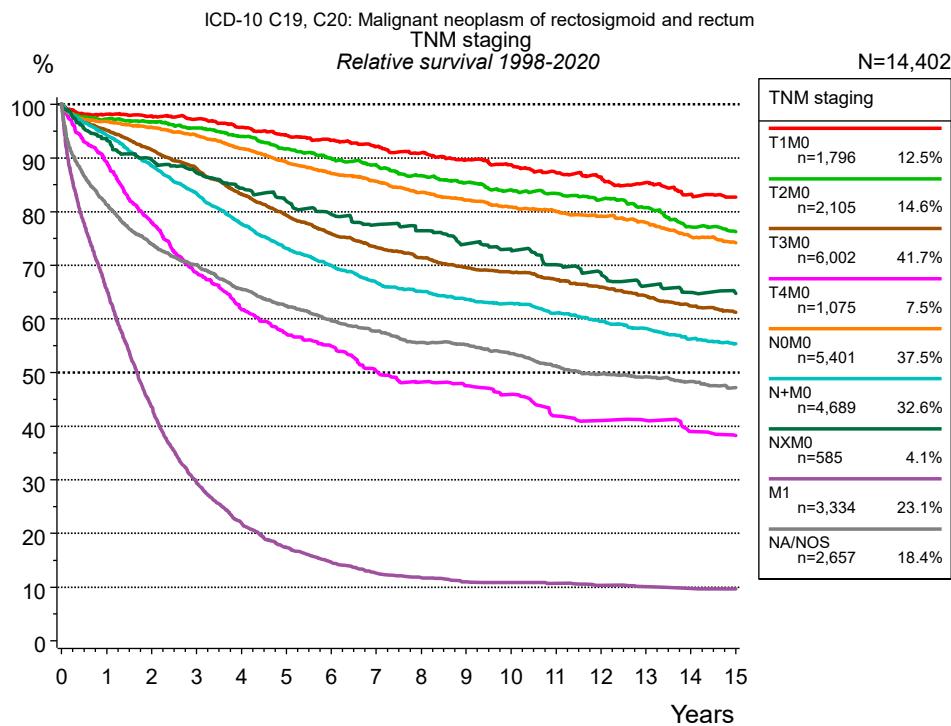


Figure 4g. Relative survival of patients with rectal cancer by TNM staging. For 16,170 of 17,059 cases diagnosed between 1998 and 2020 valid data could be obtained for this item. For a total of 14,402 cases an evaluable classification was established. The accumulated percentage exceeds the 100 % value because patients are potentially considered in more than one subgroup. The grey line represents the subgroup of 2,657 patients with missing values regarding TNM staging (15.6 % of 17,059 patients, the percent values of all other categories are related to n=14,402).

| Years | TNM staging | | | | | | | | | | | | | |
|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|---------------|--------|
| | T1M0 n=1,796 | | T2M0 n=2,105 | | T3M0 n=6,002 | | T4M0 n=1,075 | | N0M0 n=5,401 | | N+M0 n=4,689 | | NXM0 n=585 | |
| | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 95.8 | 98.2 | 94.4 | 97.3 | 92.5 | 95.2 | 86.8 | 89.3 | 93.9 | 96.8 | 91.9 | 94.3 | 91.0 | 93.6 |
| 2 | 93.2 | 97.9 | 91.1 | 96.7 | 86.6 | 91.6 | 73.6 | 77.9 | 90.2 | 95.7 | 84.3 | 88.6 | 84.8 | 89.7 |
| 3 | 90.3 | 97.3 | 87.4 | 95.6 | 81.1 | 88.0 | 63.2 | 68.6 | 86.2 | 94.2 | 77.5 | 83.4 | 80.3 | 87.2 |
| 4 | 86.5 | 95.7 | 83.3 | 94.0 | 74.6 | 83.3 | 55.6 | 61.7 | 81.5 | 91.7 | 70.5 | 77.7 | 75.8 | 84.4 |
| 5 | 82.9 | 94.3 | 78.9 | 91.7 | 69.1 | 79.3 | 50.2 | 57.2 | 76.9 | 89.3 | 64.8 | 73.1 | 71.6 | 81.9 |
| 6 | 79.9 | 93.3 | 75.1 | 90.0 | 64.3 | 75.8 | 47.1 | 54.9 | 72.8 | 87.1 | 60.5 | 69.9 | 67.8 | 79.5 |
| 7 | 76.7 | 92.1 | 71.8 | 88.8 | 60.5 | 73.3 | 42.0 | 50.3 | 69.4 | 85.6 | 56.4 | 66.8 | 64.4 | 77.5 |
| 8 | 73.5 | 90.9 | 67.9 | 86.6 | 57.3 | 71.4 | 39.2 | 48.2 | 65.6 | 83.6 | 53.6 | 65.1 | 61.9 | 76.4 |
| 9 | 70.2 | 89.7 | 64.8 | 85.4 | 54.2 | 69.6 | 37.6 | 47.6 | 62.4 | 82.1 | 51.1 | 63.7 | 58.1 | 74.0 |
| 10 | 67.4 | 88.7 | 61.6 | 84.0 | 51.8 | 68.7 | 35.4 | 45.9 | 59.4 | 80.9 | 49.0 | 62.9 | 55.7 | 72.9 |
| 11 | 64.1 | 87.3 | 59.2 | 83.4 | 49.3 | 67.3 | 31.3 | 41.9 | 56.8 | 80.1 | 46.3 | 61.1 | 52.2 | 70.2 |
| 12 | 61.3 | 86.5 | 56.3 | 82.3 | 46.7 | 65.9 | 30.1 | 41.0 | 54.2 | 79.2 | 43.8 | 59.5 | 49.4 | 68.6 |
| 13 | 58.3 | 85.4 | 53.4 | 80.8 | 44.0 | 64.3 | 29.3 | 41.1 | 51.5 | 78.0 | 41.5 | 58.2 | 45.8 | 66.2 |
| 14 | 54.7 | 83.2 | 49.0 | 77.1 | 41.2 | 62.4 | 26.8 | 39.0 | 47.8 | 75.3 | 38.9 | 56.3 | 43.7 | 65.0 |
| 15 | 52.2 | 82.7 | 46.8 | 76.2 | 38.9 | 61.2 | 25.6 | 38.3 | 45.3 | 74.2 | 37.0 | 55.4 | 41.8 | 64.7 |
| Median | 16.0 | | 13.8 | | 10.7 | | 5.0 | | 13.4 | | 9.4 | | 11.6 | |

| <i>cont'd</i> Years | TNM staging | | | |
|------------------------|---------------|--------|-------------------|--------|
| | M1 n=3,334 | | NA/NOS n=2,657 | |
| | obs. % | rel. % | obs. % | rel. % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 63.8 | 65.5 | 77.8 | 81.3 |
| 2 | 41.5 | 43.6 | 68.2 | 73.9 |
| 3 | 27.6 | 29.5 | 62.6 | 70.1 |
| 4 | 20.2 | 22.0 | 56.8 | 65.6 |
| 5 | 15.6 | 17.4 | 52.4 | 62.4 |
| 6 | 12.9 | 14.7 | 48.5 | 59.6 |
| 7 | 10.9 | 12.6 | 45.5 | 57.7 |
| 8 | 10.0 | 11.8 | 42.6 | 55.6 |
| 9 | 9.1 | 11.0 | 40.9 | 55.2 |
| 10 | 8.7 | 10.8 | 38.3 | 53.5 |
| 11 | 8.4 | 10.7 | 35.5 | 51.2 |
| 12 | 7.9 | 10.4 | 33.2 | 49.7 |
| 13 | 7.5 | 10.1 | 31.8 | 49.2 |
| 14 | 7.1 | 9.7 | 30.1 | 48.3 |
| 15 | 6.9 | 9.7 | 28.4 | 47.2 |
| Median | 1.6 | | 5.6 | |

Table 4h. Observed (obs.) and relative (rel.) survival of patients with rectal cancer by TNM staging for period 1998-2020 (N=14,402).

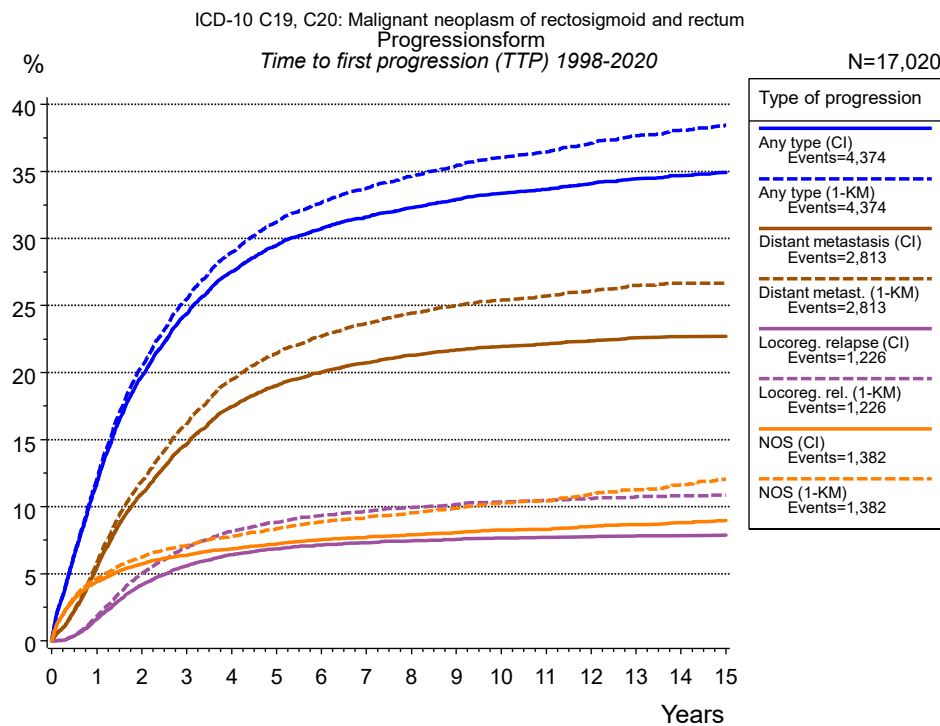


Figure 5a. Time to first progression of 17,020 patients with rectal cancer diagnosed between 1998 and 2020 (in solid cancers M0 only) estimated by cumulative incidence function (CI, solid line) accounting for death as competing risk and by inverse Kaplan-Meier estimate (1-KM, dashed line). The frequency of events may be underestimated due to underreporting.

| | | Type of progression | | | | | |
|---------|--------|---------------------|-----------------|-------------------------|------------------------|-----------------------|----------------------|
| | | Any type (CI) | Any type (1-KM) | Distant metastasis (CI) | Distant metast. (1-KM) | Locoreg. relapse (CI) | Locoreg. rel. (1-KM) |
| N | 13,750 | 13,750 | 13,750 | 13,751 | 13,751 | 17,020 | 17,020 |
| Events | 4,341 | 4,341 | 4,341 | 2,807 | 2,807 | 1,216 | 1,216 |
| compet. | 2,909 | | | 4,149 | | 8,310 | |
| Years | % | % | % | % | % | % | % |
| 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1 | 11.8 | 12.1 | 5.5 | 5.8 | 1.6 | 1.8 | 4.4 |
| 2 | 19.7 | 20.4 | 10.9 | 11.9 | 4.2 | 5.0 | 5.7 |
| 3 | 24.4 | 25.5 | 14.6 | 16.1 | 5.6 | 6.9 | 6.4 |
| 4 | 27.5 | 29.0 | 17.4 | 19.5 | 6.4 | 8.2 | 6.8 |
| 5 | 29.5 | 31.2 | 19.0 | 21.4 | 6.8 | 8.8 | 7.2 |
| 6 | 30.7 | 32.7 | 20.0 | 22.7 | 7.1 | 9.3 | 7.5 |
| 7 | 31.6 | 33.7 | 20.7 | 23.7 | 7.3 | 9.7 | 7.7 |
| 8 | 32.3 | 34.6 | 21.3 | 24.4 | 7.5 | 9.9 | 7.9 |
| 9 | 32.9 | 35.5 | 21.7 | 25.0 | 7.6 | 10.2 | 8.1 |
| 10 | 33.4 | 36.1 | 22.0 | 25.4 | 7.7 | 10.4 | 8.3 |
| 11 | 33.7 | 36.5 | 22.1 | 25.7 | 7.7 | 10.5 | 8.3 |
| 12 | 34.1 | 37.1 | 22.4 | 26.1 | 7.8 | 10.6 | 8.5 |
| 13 | 34.5 | 37.7 | 22.6 | 26.5 | 7.8 | 10.7 | 8.7 |
| 14 | 34.7 | 38.1 | 22.7 | 26.7 | 7.9 | 10.8 | 8.8 |
| 15 | 34.9 | 38.4 | 22.7 | 26.7 | 7.9 | 10.9 | 9.0 |

| Type of progression | |
|---------------------|------------|
| <i>cont'd</i> | NOS (1-KM) |
| N | 17,019 |
| Events | 1,361 |
| compet. | |
| Years | % |
| 0 | 0.0 |
| 1 | 4.6 |
| 2 | 6.2 |
| 3 | 7.1 |
| 4 | 7.8 |
| 5 | 8.3 |
| 6 | 8.9 |
| 7 | 9.2 |
| 8 | 9.5 |
| 9 | 9.9 |
| 10 | 10.3 |
| 11 | 10.4 |
| 12 | 10.9 |
| 13 | 11.3 |
| 14 | 11.6 |
| 15 | 12.1 |

Table 5b. Time to first progression of patients with rectal cancer for period 1998-2020 (N=17,020), also showing the total of progression events (Events) and of deaths as competing risk (compet.).

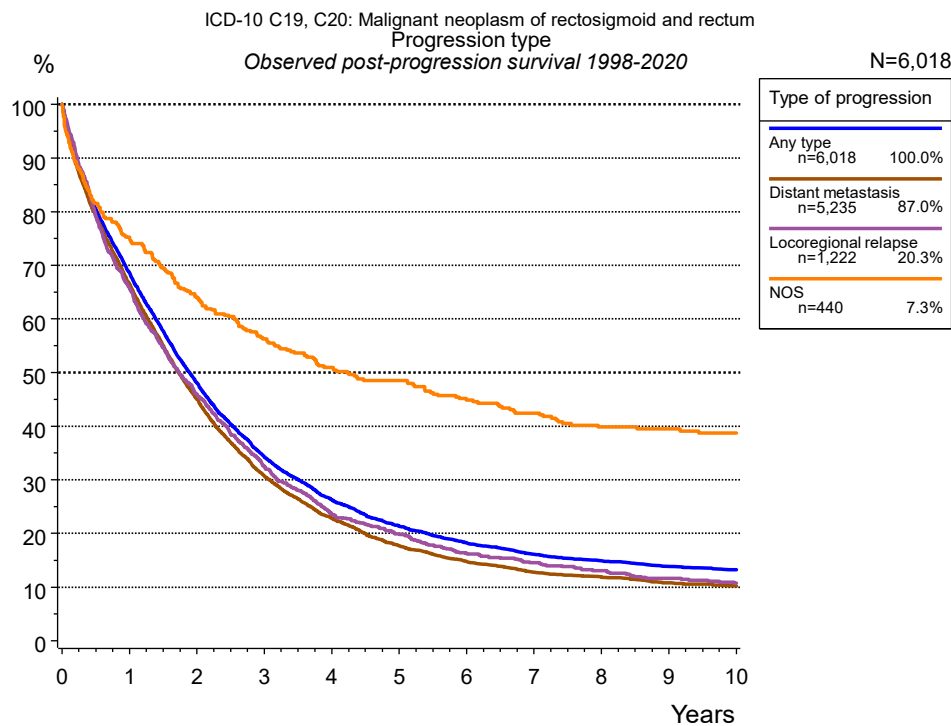


Figure 5c. Observed post-progression survival of 6,018 patients with rectal cancer diagnosed between 1998 and 2020. These 6,018 patients with documented progression events during their course of disease represent 35.4 % of the totally 17,020 evaluated cases (incl. M1, n=3,270, 19.2 %). Patients with cancer relapse documented via death certificates only were excluded (n=1,626, 9.6 %). Multiple progression types on different sites are included in the evaluation even when not occurring synchronously. The NOS (not otherwise specified) class is included under the condition, that it is the one and only progression type during the course of disease.

Medical record documentation often lacks the linguistic severity to distinguish between local relapse, regional lymph node metastasis and distant spread in solid cancers. Frequently, the statement “not specified” is the only information in registries regarding relapse of the disease. The category “Any type” denotes all cases who suffered from at least one relapse during the course of disease (incl. primary M1-status). Although, the real number of relapsed patients is likely to be much higher. The accumulated percentage of patients with local relapse or distant metastasis exceeds the 100 % value because patients are potentially considered in more than one subgroup.

| Years | Type of progression | | | |
|-------|--------------------------|---------------------------------------|---|-------------------|
| | Any type n=6,018 % | Distant metastasis n=5,235 % | Locoregional relapse n=1,222 % | NOS n=440 % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 68.5 | 66.5 | 65.6 | 75.2 |
| 2 | 48.1 | 45.1 | 45.9 | 63.9 |
| 3 | 34.3 | 30.7 | 32.6 | 56.3 |
| 4 | 26.2 | 22.9 | 23.6 | 51.0 |
| 5 | 21.4 | 17.7 | 19.9 | 48.5 |
| 6 | 18.2 | 14.8 | 16.3 | 44.8 |
| 7 | 16.1 | 12.8 | 14.5 | 42.4 |
| 8 | 14.9 | 11.9 | 13.1 | 39.8 |
| 9 | 13.9 | 10.8 | 11.6 | 39.5 |
| 10 | 13.2 | 10.2 | 10.7 | 38.7 |

Table 5d. Observed post-progression survival of patients with rectal cancer for period 1998-2020 (N=6,018).

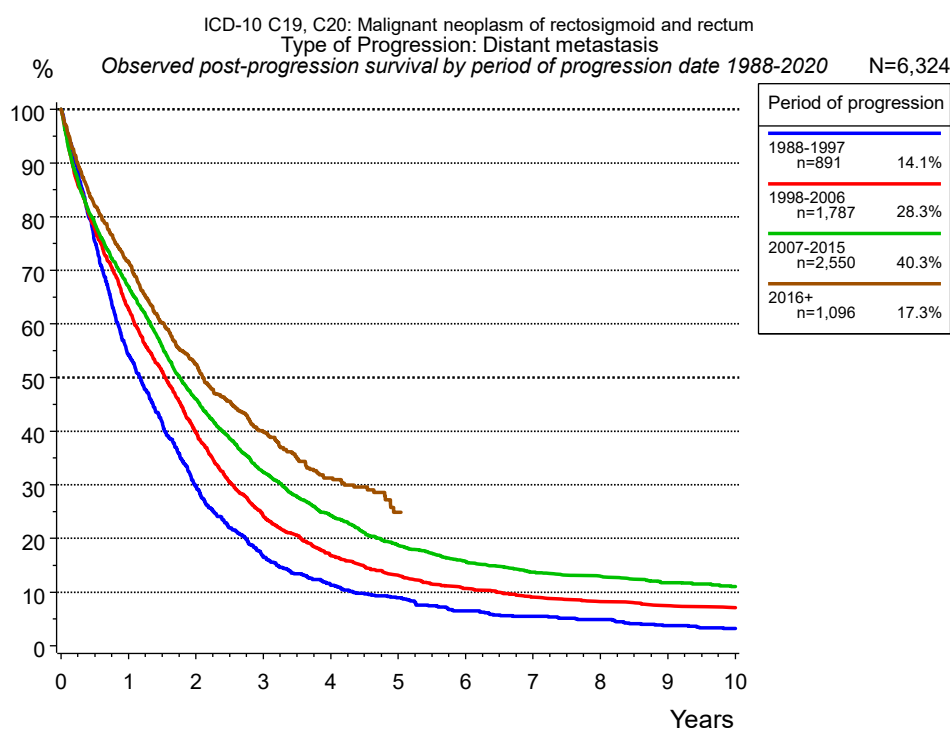


Figure 5e. Observed post-progression (distant metastasis) survival of 6,324 patients with rectal cancer diagnosed between 1988 and 2020 by period of progression.

| Years | Period of progression | | | |
|-------|-------------------------|---------------------------|---------------------------|-----------------------|
| | 1988-1997 n=891 % | 1998-2006 n=1,787 % | 2007-2015 n=2,550 % | 2016+ n=1,096 % |
| 0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1 | 54.2 | 62.7 | 67.0 | 71.5 |
| 2 | 29.8 | 39.7 | 46.0 | 52.4 |
| 3 | 16.6 | 24.2 | 32.4 | 39.9 |
| 4 | 11.3 | 16.9 | 24.3 | 31.3 |
| 5 | 8.9 | 13.1 | 18.7 | 24.9 |
| 6 | 6.5 | 10.6 | 15.7 | |
| 7 | 5.5 | 9.1 | 13.7 | |
| 8 | 4.9 | 8.2 | 12.9 | |
| 9 | 3.8 | 7.5 | 11.8 | |
| 10 | 3.3 | 7.1 | 11.0 | |

Table 5f. Observed post-progression (distant metastasis) survival of patients with rectal cancer for period 1988-2020 by period of progression (N=6,324).

Shortcuts

MCR Munich Cancer Registry, Germany

NCI National Cancer Institute, USA

SEER Surveillance, Epidemiology, and End Results, USA

UICC Union for International Cancer Control, Geneva

DCO Death certificate only Death certificate provides the only notification to the registry.

NA Not available

NOS Not otherwise specified

OS Overall/Observed survival Overall/Observed survival (Kaplan-Meier estimate)

Date of entry: diagnosis
Event: death from any cause

RS Relative survival Survival compared to “general population”, ratio of observed to expected survival (Ederer II method), reflecting cancer specific survival

AS Assembled survival Assembled chart of observed, expected, relative survival

CS Conditional survival Survival probability under the condition of surviving a given period of time

TTP Time to progression Time to first progression / relapse
Date of entry: diagnosis
Event: (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression

1-KM 1 minus Kaplan-Meier estimator (“inverse” Kaplan-Meier estimator)

CI Cumulative incidence
Death as competing risk (according to Kalbfleisch und Prentice)

PPS Post-progression survival Survival since first progression / relapse (Kaplan-Meier estimate)
Date of entry (progression / relapse): first local-, lymph node recurrence, distant metastasis or unspecified progression
Event: death from any cause

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